

REMARKS

Claims 65-85 are pending in the application. Upon entry of this response, claims 65-93 will be pending, claims 65, 68, 72, and 82 having been amended and claims 86-93 added in this response. The amendments and new claims find support in the specification, page 9, ll. 4-5; page 11, ll. 12-13, for example. Accordingly, there are no issues of new matter.

103(a) Rejections

Nagai in view of Kaschke

Claims 65, 66, and 72-85 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Nagai (JP 10-294,135) in view of Kaschke (US 5,898,933). Applicant traverses the rejections.

Claim 65 as amended is directed to a portable electrical device comprising, *inter alia*, a flexible supercapacitor that has at least one electrode with a coating.

In contrast, Nagai neither teaches nor suggests a supercapacitor that has at least one electrode with a coating. Rather, Nagai discloses an electric double layer capacitor that includes activated carbon fibers. See Nagai, ¶ 0014; Drawing 1.

A fiber, as in Nagai, is very different from a coating, as in Applicants' claimed invention. For example, a fiber, as in Nagai, provides a much lower surface area for a given volume than a coating, as in Applicant's claimed invention, for that same volume. Therefore, to provide a desired capacitance, the volume of fiber provided by Nagai is quite high, as indicated by the required thickness of the double layer capacitor. See Nagai, ¶¶ 0011, 0014. Whereas, Applicant's claimed coating provides the greater surface area for a given volume, which, Applicant has discovered, provides a smaller and thinner supercapacitor with a much lower equivalent series resistance (ESR), improves the pulse performance of the supercapacitor/battery combination and, ultimately, more greatly increases run-time for the pulsed load being supplied. Hence, Applicant's supercapacitors provide higher capacitance per unit volume.

In an embodiment, Applicant's supercapacitor is only 0.2 mm thick, which provides a 0.4 mm total increase in overall diameter of the battery. See, e.g., specification, page 10, ll. 1-3. In contrast, Nagai's double layer capacitor is 1.4 mm and 1.2 mm thick, which is an order of magnitude greater than Applicant's supercapacitor. See Nagai, ¶¶ 0018, 0025, 0033. Indeed, Nagai teaches away from thin devices as being workable. See Nagai, ¶ 0010-0011.

Applicant has further discovered that the thin coating of Applicant's electrode shows less degradation and disintegration upon flexing and bending of the electrode. Thus, supercapacitors' electrodes accommodate greater flexing and bending, notwithstanding their relative thinness.

Therefore, it is clear that Nagai does not disclose the coatings on electrodes, as in Applicant's claimed invention.

Furthermore, there is neither teaching nor suggestion in Nagai to replace its activated carbon fibers with coatings on electrodes. Rather, as stated previously, Nagai teaches the use of fibers of a given thickness to contribute to the required thickness range of the capacitor to ensure that required capacitance is provided. See Nagai, ¶¶ 0011, 0014.

The above deficiencies of Nagai are not corrected by Kaschke because Kaschke also fails to teach or suggest a supercapacitor that has at least one electrode with a coating. Therefore, the combination of Nagai with Kaschke would still not provide the portable electrical device of Applicant's claim 65.

For at least these reasons, claim 65 and its dependent claim 66 are believed to be patentable over Nagai in view of Kaschke.

Claim 72 as amended is directed to a portable electrical device comprising, *inter alia*, a supercapacitor having at least two electrodes having respective coatings. For at least the same reasons as set forth above regarding claim 65, claim 72 and its dependent claims 73-81 are believed to be patentable over Nagai in view of Kaschke.

Claim 82 as amended is directed to a portable electrical device comprising, *inter alia*, a supercapacitor having at least two electrodes, each electrode including a coating. For at least the same reasons as set forth above regarding claim 65, claim 82 and its dependent claims 83-85 are believed to be patentable over Nagai in view of Kaschke.

Withdrawal of the rejections is therefore requested.

Nagai in view of Kaschke in further view of Jennings

Claims 68-71 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Nagai in view of Kaschke in further view of Jennings (US 5,612,675). Applicant traverses the rejections.

Claim 68 as amended is directed to a portable electrical device comprising, *inter alia*, a flexible supercapacitor having at least two electrodes with respective coatings.

As stated above regarding claim 65, neither Nagai nor Kaschke teach or suggest a supercapacitor having electrodes with coatings. These deficiencies are not corrected by Jennings because Jennings also fails to teach or suggest a supercapacitor having electrodes with coatings. Thus, the combination of Nagai in view of Kaschke in further view of Jennings would still not provide the portable electrical device of Applicant's claim 68. Therefore, claim 68 and its dependent claims 69-71 are believed to be patentable over these cited references.

Withdrawal of the rejections is therefore requested.

Nagai in view of Kaschke in further view of Bartschi

Claims 68-71 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Nagai in view of Kaschke in further view of Bartschi (US 5,734,976). Applicant traverses the rejections.

The deficiencies of Nagai and Kaschke are not corrected by Bartschi because Bartschi also fails to teach or suggest a supercapacitor having electrodes with coatings. Thus, the combination of Nagai in view of Kaschke in further view of Bartschi would still not provide the portable electrical device of Applicant's claim 68. Therefore, claim 68 and its dependent claims 69-71 are believed to be patentable over these cited references.

Withdrawal of the rejections is therefore requested.

New Claims

New claims 86-93 are believed to be patentable over the cited references for at least the same reasons as their respective independent claims.

CONCLUSION

The claims are believed to be allowable. Applicant requests that the response be entered and considered by the Examiner.

The Examiner is invited to contact the undersigned at (202) 220-4200 to discuss any matter concerning this application.

The Office is authorized to charge any fees or credit any overpayment associated with this filing to Deposit Account No. 11-0600.

Respectfully submitted,

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